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OPENAIR BIOFACTORIES

REMOVING THE CELL WALL

NIJU NARAYANAN
POSTDOCTORAL RESEARCH ASSOCIATE
BIOSCIENCE

WHAT DO ALL OF THESE CONSUMER PRODUCTS HAVE IN COMMON?



FINITE
RESOURCES



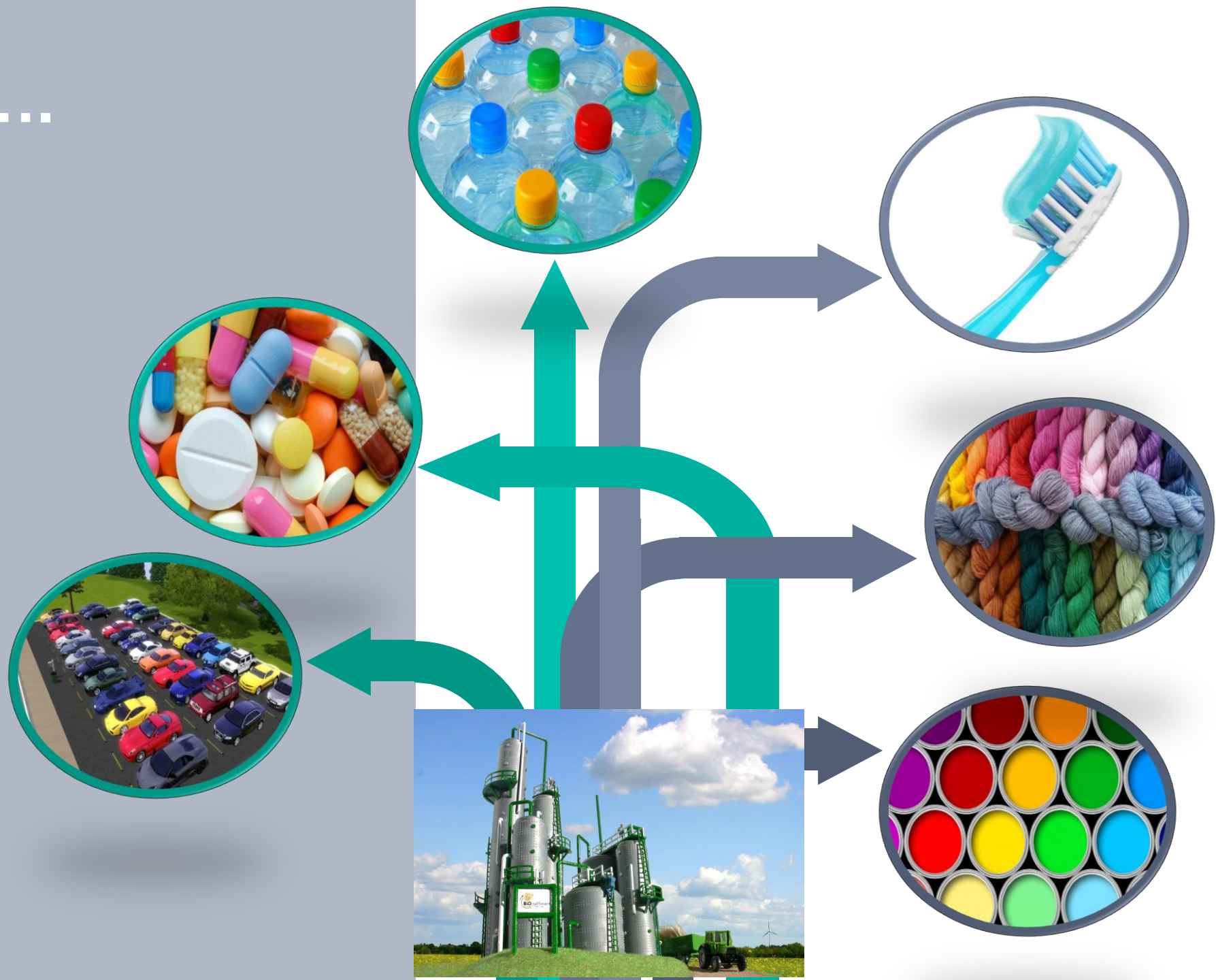
CONTAMINATED
WITH TOXIC
CHEMICALS

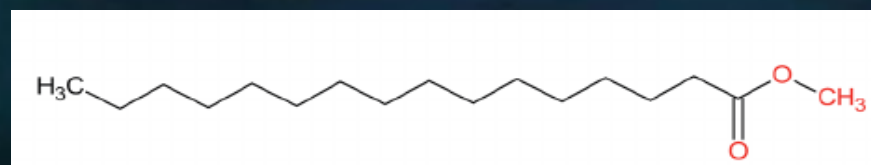
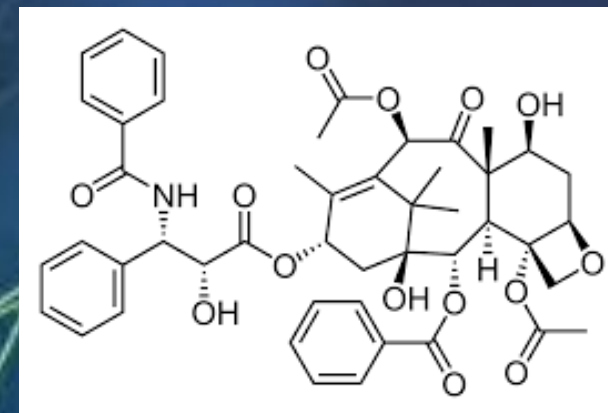
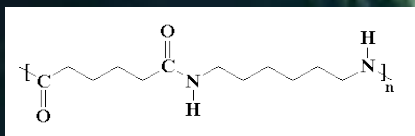


PRODUCTION EMITS
CO₂



BUT WHAT IF....

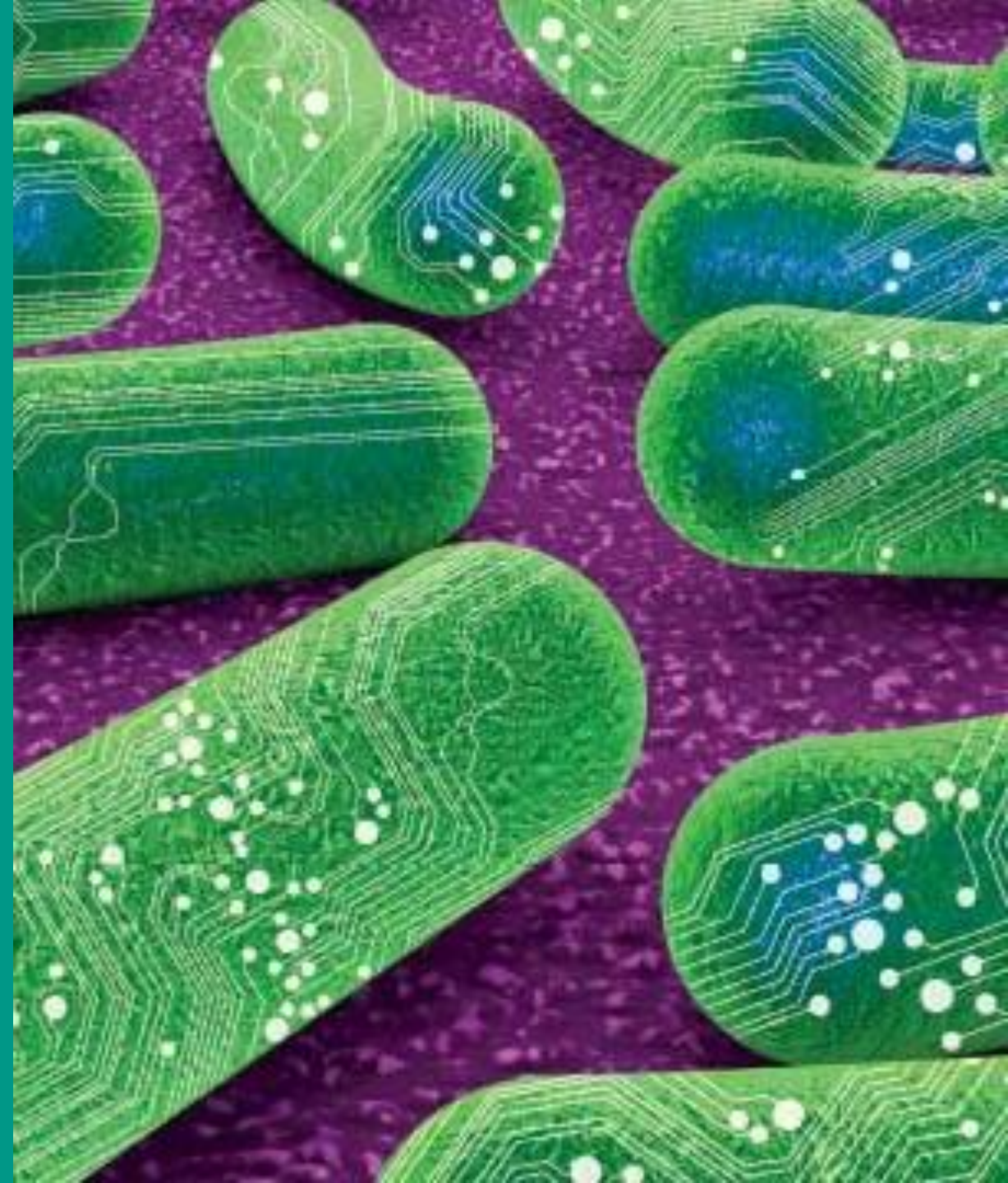






What is
SYNTHETIC BIOLOGY?

THE DESIGN AND/OR RE-DESIGN AND
CONSTRUCTION OF NOVEL
ARTIFICIAL BIOLOGICAL PATHWAYS,
ORGANISMS, OR DEVICES OF
EXISTING NATURAL BIOLOGICAL
SYSTEMS FOR USEFUL PURPOSES.



SYNTHETIC BIOLOGY MARKET IS GROWING QUICKLY

\$12.5B

**EXPECTED GLOBAL MARKET
SIZE BY 2024**

26.4%

**CAGR FROM 2019 TO
2026**



HEALTHCARE



FOOD & DRINK



INDUSTRIAL CHEMICALS



BIOFUELS



DNA & RNA SYNTHESIS



SOFTWARE



CONSUMER PRODUCTS



AGRICULTURE



ORGANISM ENGINEERING & AUTOMATION PLATFORMS

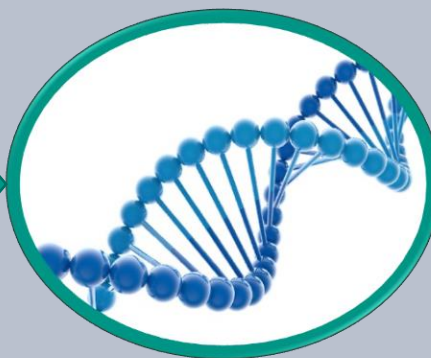


IT IS A
COMPETITIVE
SPACE



STEP 1

IDENTIFY DNA
FROM PLANTS,
HUMANS, BUGS,
ETC. WITH
DESIRED
PROPERTIES



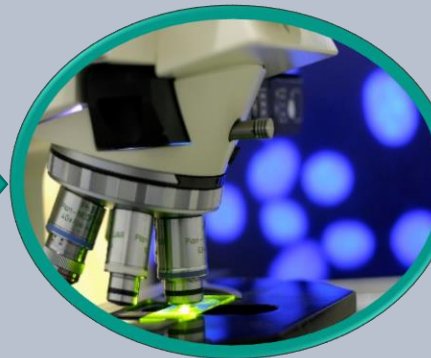
STEP 2

EXTRACT DNA
FROM THE
SOURCE



STEP 3

IMPLANT DNA INTO
BIO FACTORY



STEP 4

TEST DIFFERENT
DNA
COMBINATIONS IN
THE LAB TO FIND
THE STRONGEST
DESIGN



STEP 5

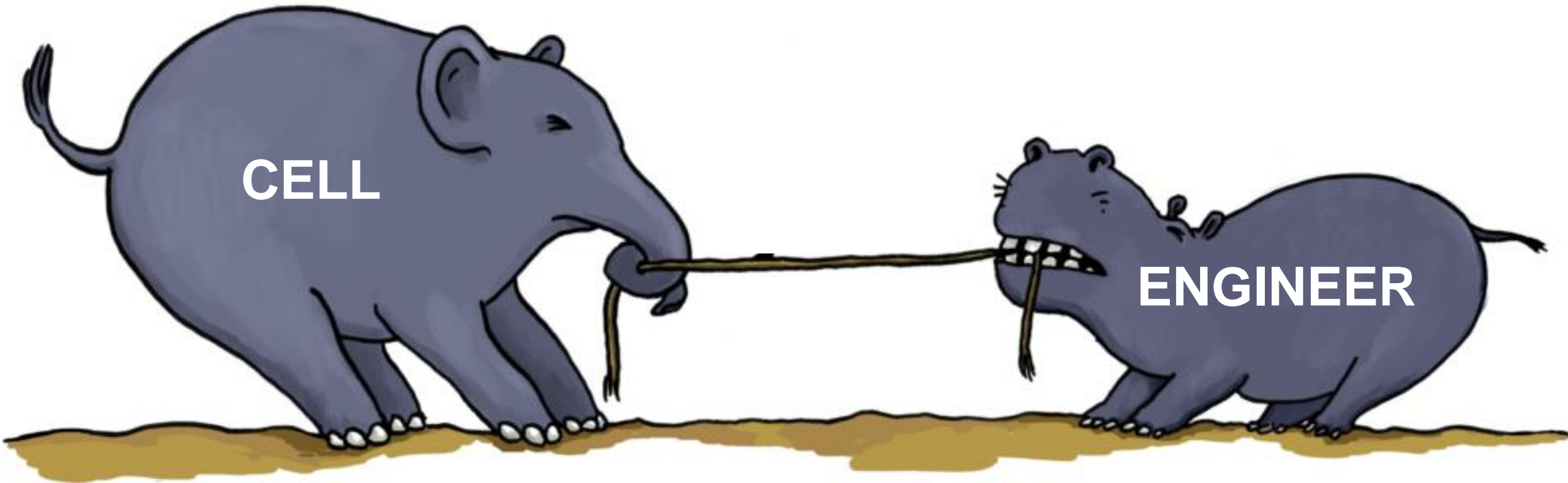
SCALE
PRODUCTION AND
CREATE THE BIO
PRODUCT

CARPET FIBER

15 YEARS TIME TO MARKET

\$120M R&D COST

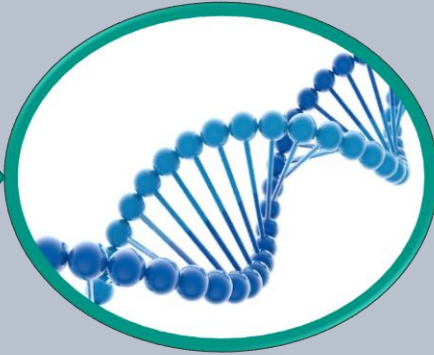
TUG OF WAR





STEP 1

IDENTIFY DNA
FROM PLANTS,
HUMANS, BUGS,
ETC. WITH
DESIRED
PROPERTIES



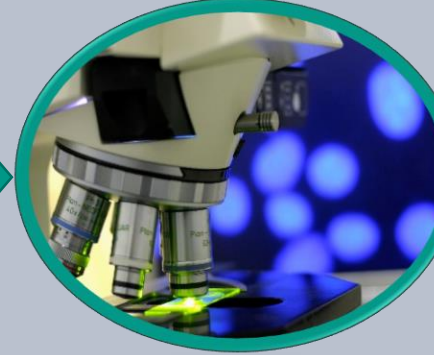
STEP 2

EXTRACT DNA
FROM THE
SOURCE



STEP 3

IMPLANT DNA INTO
BIO FACTORY



STEP 4

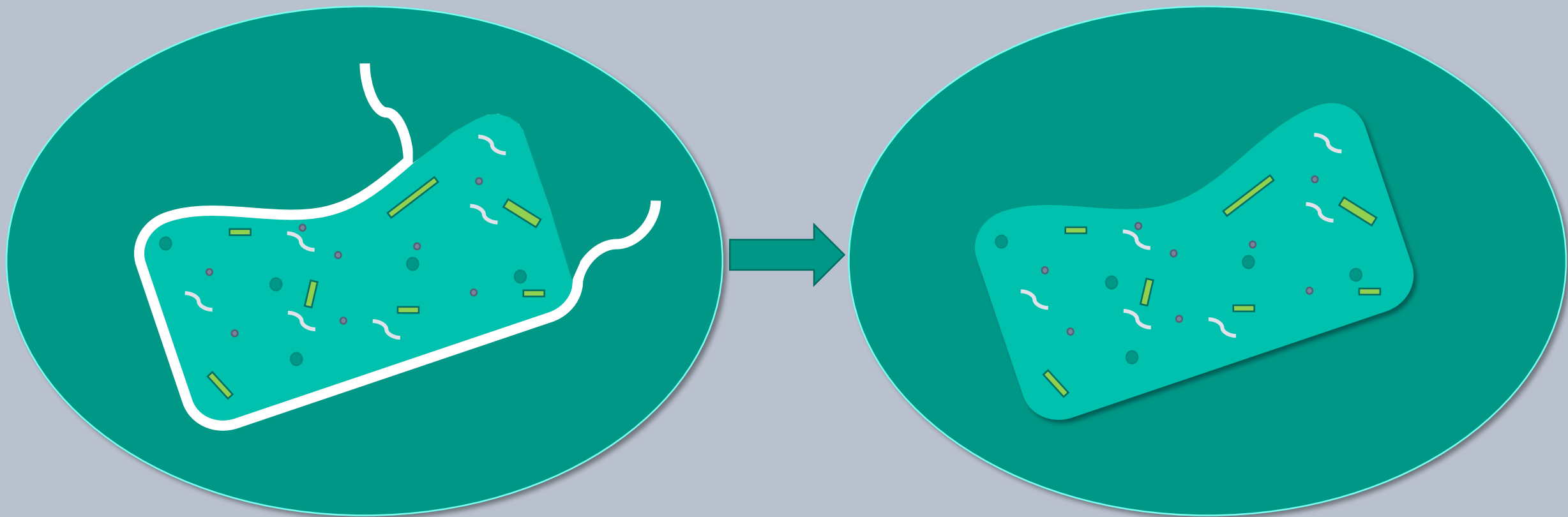
TEST DIFFERENT
DNA
COMBINATIONS IN
THE LAB TO FIND
THE STRONGEST
DESIGN



STEP 5

SCALE
PRODUCTION AND
CREATE THE BIO
PRODUCT



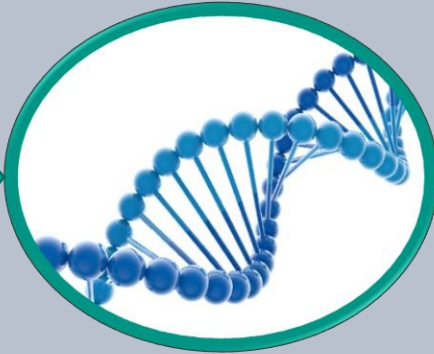


CELL-FREE SYNTHETIC BIOLOGY



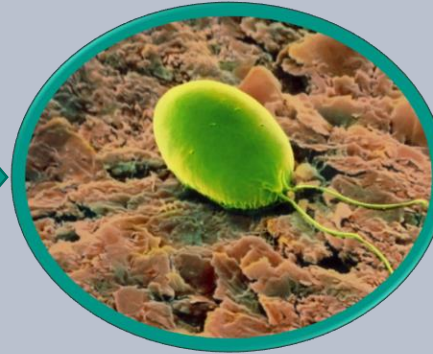
STEP 1

IDENTIFY DNA
FROM PLANTS,
HUMANS, BUGS,
ETC. WITH
DESIRED
PROPERTIES



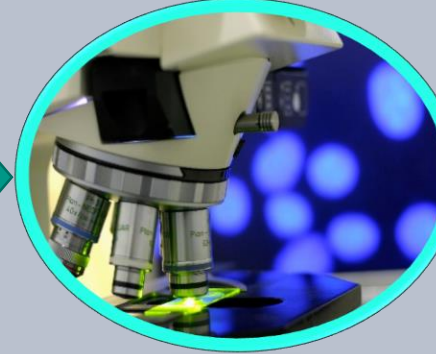
STEP 2

EXTRACT DNA
FROM THE
SOURCE



STEP 3

IMPLANT DNA INTO
BIO FACTORY



STEP 4

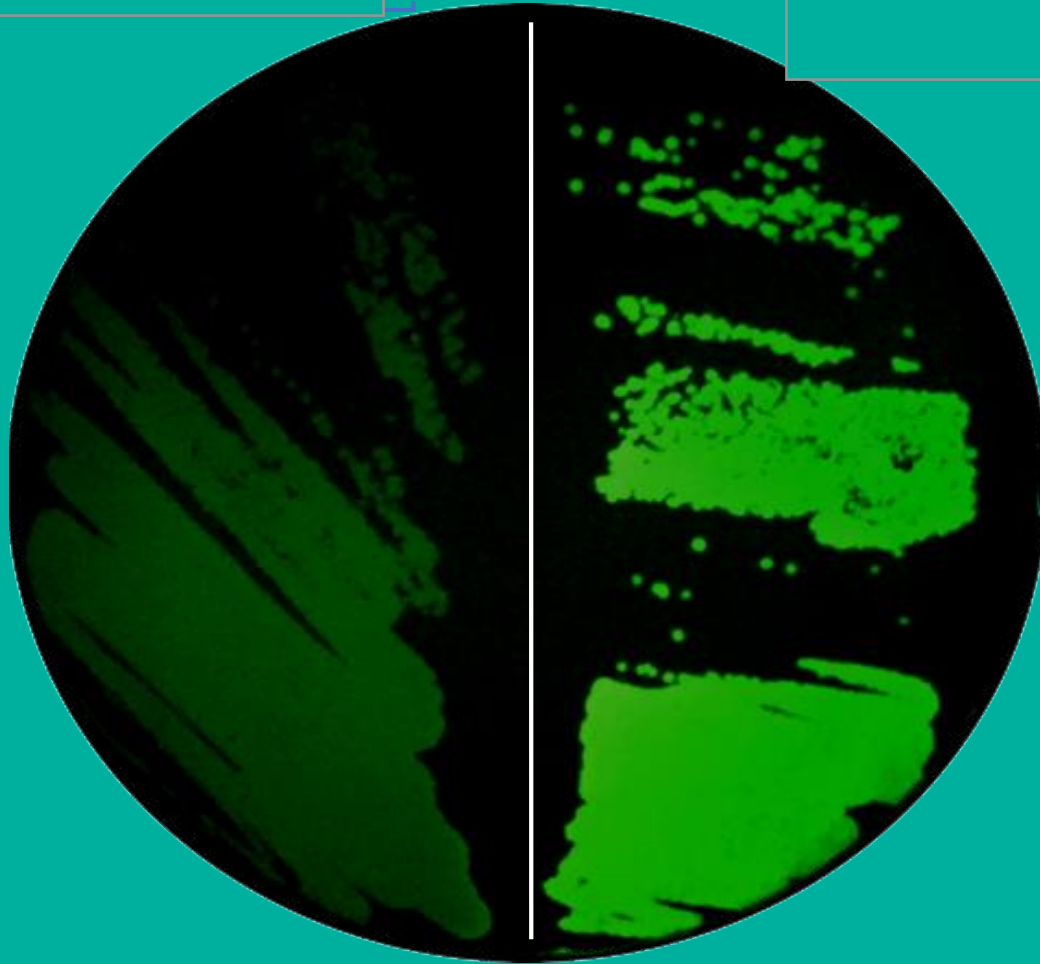
TEST MILLION OF
DNA
COMBINATIONS,
ONE WITH THE
BRIGHTEST
FLUORESCENCE
IS THE BEST
DESIGN



STEP 5

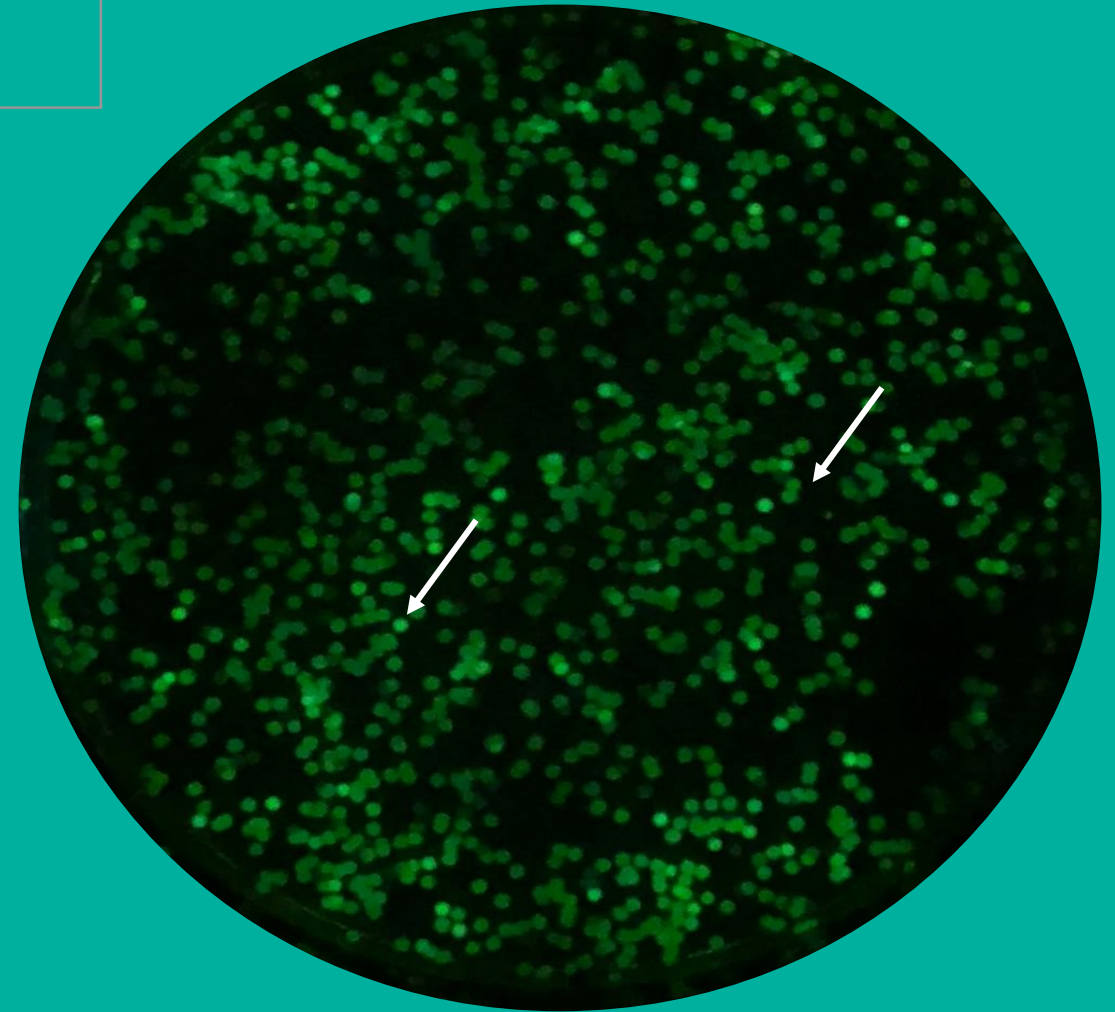
SCALE
PRODUCTION AND
CREATE THE
BIOMATERIAL

BIOSENSOR



Low producer

High producer



Library of diversified producers

BENEFITS OF OUR TECHNOLOGY



FASTER



CHEAPER



GREATER YIELD



MORE CONTROL



ELIMINATE TOXICITY



**INSTANTLY INTRODUCE NEW
PROPERTIES**



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BIOLOGICAL
ENGINEERING

An AIChE Technological Community

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People & Community

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Cell Free Systems Conference



Cell Free Systems Conference

December 4-6, 2019

Add to Calendar

Hyatt Regency Boston, Boston, MA

The Cell Free Systems Conference will focus on understanding, harnessing and expanding the capabilities of biological systems without living intact cells.

Abstract Deadline: Thursday, October 31, 2019

Submit an Abstract

Conference Flyer

EPFL

search query

EPFL > STI > IBI > LBNC

2ND EUROPEAN CONGRESS ON CELL-FREE SYNTHETIC BIOLOGY (ECCSB)

Home

Speakers

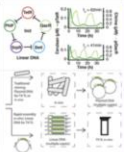


Program / Talks

Registration / Information

Venue

Travel Info

Share:



Topics:

• Cell-Free Synthetic Biology

• DNA/RNA/Protein Networks

• Minimal / Synthetic Cells

• Microfluidics

• and many more ...

CONFERENCE ORGANIZERS

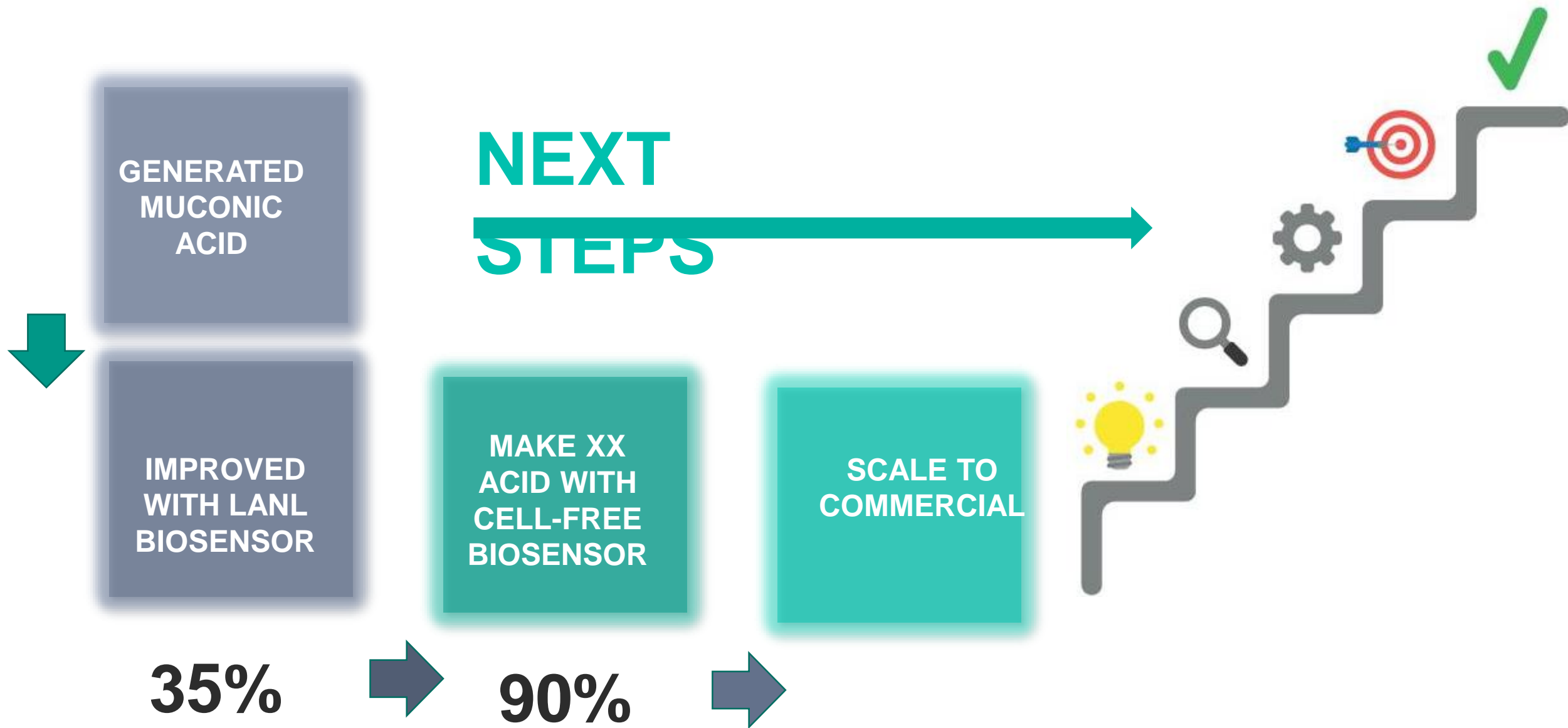
Friedrich Simmel, TUM
Sebastian Maerk, EPFL

KEY NUMBERS

May 18-21, 2020
TBD Senior Speakers
TBD Junior Speakers (Post-doc/PhD level)

2nd European Congress on Cell-Free Synthetic Biology

18 - 21 May 2020, Burghausen Germany



ASK SLIDE

What product would you like with Cell-Free Synthetic Biology as a market ?

THANK YOU

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